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A T E R I A L S A F E T Y I T A S H E E T

RHONE-POULENC BASIC CHEMICALS CO.
1 Corporate Drive Box 881 Shelton, Conn 06484
24-HOUR EMERGENCY TELEPHONE CHEMTREC 1-800-424-9300

Effective Date: APR 04, 1991 Date Printed: APR 5, 1991
Supercedes: OCT 09, 1989

PRODUCT NAME: SULFURIC ACID

I. IDENTIFICATION

CHEMICAL NAME OF PRIMARY COMPONENT(S): sulfuric acid

FORMULA: H_2SO_4 MOLECULAR WEIGHT: 98.08

SYNONYMS: Oil of vitrol; hydrogen sulfate; battery acid

CAS # & NAME: 7664-93-9 Sulfuric acid

II. INGREDIENTS/SUMMARY OF HAZARDS

INGREDIENT(S)	CAS Number	OSHA Hazardous (H)/ Non-Hazardous (NH)	Percent	
(1) Sulfuric acid	7664-93-9	H	78-100	
(2) Water		NH	Balance	R

WARNING STATEMENTS:

DANGER!
CAUSES SEVERE BURNS
REACTS VIOLENTLY WITH WATER
CONTENTS MAY BE UNDER PRESSURE OF EXPLOSIVE HYDROGEN GAS
HIGHLY REACTIVE AND CAPABLE OF IGNITING COMBUSTIBLE MATERIAL ON CONTACT

See Section VI for complete Health Hazard Data.

NATIONAL FIRE PROTECTION ASSOCIATION RATING
HAZARDOUS MATERIALS IDENTIFICATION SYSTEM

KEY - NFPA/HMIS	NFPA	HMIS
	Health	
4=Extreme/ Severe	3	3
3=High/ Serious	Fire 0	0
2=Moderate		
1=Slight	Reactivity	
0=Minimum	2	2
-W- = Water Reactive	Special -W-	

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MATERIAL SAFETY DATA SHEET

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II. INGREDIENTS/SUMMARY OF HAZARDS (continued)

SARA TITLE III HAZARD CLASSIFICATION

Immediate (acute) Health	YES
Delayed (chronic) Health	NO
Fire	NO
Sudden Release of Pressure	NO
Reactive	YES

III. PHYSICAL DATA

SPECIFIC GRAVITY:	78% = 1.7 92-100% = 1.8
BOILING POINT, 760 mm Hg, Degrees C (F):	78% = 193 C (380 F) 93% = 276 C (529 F)
MELTING POINT, Degrees C (F):	78% = -11.3 C (11.6 F) 93% = -28.9 C (-20 F)
VAPOR PRESSURE, 37.8 Degrees C:	<1 mm Hg
VAPOR DENSITY (air=1):	3.4
pH:	<1 (1% aqueous solution)
SOLUBILITY IN WATER:	Miscible R
APPEARANCE AND ODOR:	Clear, colorless to cloudy, oily liquid; odorless

For additional technical information, call 1-203-925-3300. R

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Degrees C (F): Noncombustible

FLAMMABLE LIMITS IN AIR: None

AUTOIGNITION TEMPERATURE Degrees C (F): None

EXTINGUISHING MEDIA: Expect violent reaction with water. For small fires use dry chemical, carbon dioxide or halon. For large fires, flood fire area with water from a distance. Do not get solid stream of water on spilled material.

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IV. FIRE AND EXPLOSION HAZARD DATA (continued)

SPECIAL FIRE FIGHTING PROCEDURES: Provide for the protection of employees and residents:

a) Evacuate residents who are downwind of fire.
b) Fight fire from safe distance or from protected location.
c) Prevent unauthorized entry to fire area.
d) Persons who may have been exposed to contaminated smoke should be examined by a physician and treated appropriately.
e) Dike area to prevent runoff and contamination of water sources.
f) Cool containers that are exposed to flame with streams of water until fire is out.

Notify local authorities that firemen should:

a) Wear protective clothing and use self-contained breathing apparatus. For fighting fires in close proximity to spill or vapors, use acid resistant personal protective equipment.
b) Be immediately relieved from duty, if exposed to contaminated smoke, and checked for symptoms of overexposure. These should not be mistaken for heat exhaustion or smoke inhalation. See Section VI, Health Hazard Data for symptoms of overexposure, first aid procedures, and notes to physician.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Thermal decomposition products may be hazardous. These may include sulfur oxides.
Use care. Water applied directly to this acid results in evolution of heat, spattering and causes a violent reaction.
High concentrations may cause nearby combustible liquids and solids to ignite upon contact.
Contact with common metals will evolve flammable and potentially explosive hydrogen gas.

V. REACTIVITY DATA

STABILITY:

Stable at ambient temperatures and atmospheric pressure.

CONDITIONS TO AVOID:

When diluting, acid should be added to diluent, DO NOT add diluent to acid.

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V. REACTIVITY DATA (continued)

MATERIALS TO AVOID:
Organics, chlorates, carbides, fulminates, picrates, metals, water.
Reacts exothermically with water.
Reacts with many metals to evolve flammable, potentially explosive hydrogen gas.
Sulfuric acid is a strong oxidizing agent and may cause ignition on contact with organic materials and chemicals such as nitrates, carbides, chlorates.

HAZARDOUS DECOMPOSITION PRODUCTS:
Toxic gas and vapors such as sulfuric acid fumes and oxides of sulfur may be released on decomposition.

HAZARDOUS POLYMERIZATION:
Will not occur.

VI. HEALTH HAZARD DATA/FIRST AID PROCEDURES

EXPOSURE LIMITS:
1 mg/cubic meter TWA, ACGIH & OSHA
3 mg/cubic meter STEL, ACGIH

TOXICOLOGY DATA:

Oral LD50 (rats):	2140 mg/kg body weight	(1)
Dermal LD50 (rabbits):	No information available	
Inhalation LC50 (rats - 4 Hour Exposure):	510 mg/m3	(1)
Skin Effects (rabbits):	Severe irritation	(1)
Eye Effects (rabbits):	Severe irritation	(1)

Fatal dose for an adult is between 1 tsp and 1/2 oz concentrated chemical

CARCINOGENICITY:
This product does not contain any ingredient designated by IARC, NTP, ACGIH or OSHA as a probable human carcinogen. A few epidemiology studies have suggested a possible association between sulfuric acid exposure and laryngeal or lung cancer; however, in all these studies, workers were exposed to many other chemicals, some of which are recognized carcinogens, such as diethylsulfate and nickel. Considering the multiple chemical exposures and other limitations of the studies, it can be concluded that no cause-and-effect relationship between cancer and sulfuric acid exposure has been demonstrated.

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VI. HEALTH HAZARD DATA/FIRST AID PROCEDURES (continued)

EFFECTS OF SINGLE OVEREXPOSURE:

Swallowing:
Corrosive. Causes burns of the mouth, throat, esophagus and stomach. May cause severe injury such as gastric perforation or peritonitis and death. (2)

Skin Absorption:
No information available.

Inhalation:
Corrosive.
Sprays (mists) are severely irritating to the respiratory tract. (2)
Causes tickling of the nose and throat, sneezing, and coughing. (2)
Breathing of concentrated mist may cause serious damage to lung tissue. (3)

Skin Contact:
Corrosive. Causes burning and charring of the skin as a result of the great affinity for, and strong exothermic reaction with water. (2)

Eye Contact:
Corrosive. Causes irreversible eye damage and possible blindness. (2)
Sprays (mists) are severely irritating to the eyes.

EFFECTS OF REPEATED OVEREXPOSURE:
Repeated exposure may lead to contact dermatitis. (4)
May cause corrosion of dental enamel. (5)
Repeated exposure can cause bronchitis with cough, phlegm, shortness of breath and emphysema. Can cause chronic runny nose, tearing of the eyes, nose bleeds and stomach upsets. (6)

OTHER EFFECTS OF OVEREXPOSURE:
See Notes To Physician.

EXISTING MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:
Skin irritation may be aggravated in persons with existing skin lesions.
Breathing of sprays (mists) may aggravate acute or chronic asthma and other chronic pulmonary disease.

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VI. HEALTH HAZARD DATA/FIRST AID PROCEDURES (continued)

EMERGENCY AND FIRST AID PROCEDURES:

SPEED IN REMOVING THIS MATERIAL FROM CONTACT WITH THE BODY IS OF PRIMARY IMPORTANCE. START FIRST AID AT ONCE.

PRECAUTION: Persons attending the victim should avoid direct contact with heavily contaminated clothing and vomitus. Wear impervious gloves while decontaminating skin and hair.

Remove the patient from immediate source of exposure and assure that the individual is breathing. If not breathing, use cardio-pulmonary resuscitation or artificial respiration. GET MEDICAL ATTENTION.

Swallowing:
If patient is conscious and alert, give 2-3 glasses of water to drink. Do not induce vomiting. GET MEDICAL ATTENTION.

Skin:
Immediately wipe excess material from skin with a dry cloth, then wash skin with plenty of soap and water, while removing contaminated clothing and shoes. Shoes and clothing contaminated by substantial spillage of concentrated product should be discarded in a manner which limits further exposure. Otherwise, wash clothing separately before reuse. GET MEDICAL ATTENTION.

Inhalation:
Remove victim to fresh air. If not breathing, administer cardio-pulmonary resuscitation or artificial respiration. If breathing is difficult, administer oxygen. GET MEDICAL ATTENTION.

Eyes:
Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. GET MEDICAL ATTENTION, IMMEDIATELY AFTER FLUSHING EYES, PREFERABLY AN OPHTHALMOLOGIST.

NOTES TO PHYSICIAN:

No specific antidote is available.

Treat symptomatically. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

The principle manifestation of overexposure is corrosion.

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VI. HEALTH HAZARD DATA/FIRST AID PROCEDURES (continued)

Ingestion

Treat asphyxia from glottal edema by maintaining an adequate airway.
Treat shock - Maintain normal blood pressure by transfusion and by the administration of 5% dextrose in saline.
If symptoms are severe and perforation of the stomach or esophagus is suspected, give nothing by mouth until endoscopic examination has been done.
Maintain nutrition by giving carbohydrate or hyperalimentary fluid intravenously.
Give prednisolone, 2 mg/kg/d in divided doses for 10 days, to reduce progression of fibrocystic and hyaline lung disease.
Esophageal stricture may require dilation.

Inhalation

Give artificial respiration.
Treat shock.
Treat pulmonary edema.
Treat bacterial pneumonia with organism-specific chemotherapy.

(7)

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Evacuate non-essential personnel. Zone off contaminated area.
Persons involved in clean-up should wear appropriate personal protective equipment. See Section VIII.
Any leak occurring in pipelines or equipment should be considered an acid leak until proven otherwise. Adjust all appropriate valves to isolate the system and stop further leakage.
Small spills should be covered with sodium bicarbonate, soda ash, or lime, taking care to avoid foaming or spattering. Insure that all liquid is absorbed on dry material. Transfer absorbed spill material and any underlying soil to a suitable chemical waste container.
Washing down spills with water is NOT recommended.
Prevent sulfuric acid from getting into sewers.
Large spills should be handled according to a predetermined plan. For assistance in developing a plan, contact the Technical Service Group, 1-203-925-3300. R

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VII. PRECAUTIONS FOR SAFE HANDLING AND USE (continued)

WASTE DISPOSAL METHOD:
Dispose of in accordance with local, state and federal regulations.

NOTE: This material is RCRA Hazardous Waste D002, corrosive.
This material is RCRA Hazardous Waste D003, reactive.
Spills are subject to CERLCA reporting requirements: RQ = 1000 lbs.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Wear appropriate protective clothing.

Do not breathe sprays or mists. Do not ingest. Do not get in eyes, on skin or on clothing.

Store in a cool, dry, well-ventilated place in tightly closed containers away from sunlight and in an area with an acid resistant cement floor.

When diluting, always add the acid slowly to water. Do not add water to acid, as large amounts of heat will be produced, and localized boiling and spattering may occur.

VIII. SPECIAL PROTECTION INFORMATION

PROTECTIVE EQUIPMENT SHOULD BE USED DURING THE FOLLOWING PROCEDURES:
- Manufacture or formulation of this product
- Repair and maintenance of contaminated equipment
- Clean-up of leaks and spills

RESPIRATORY PROTECTION: Use NIOSH/MSHA approved mist filter, acid gas cartridge respirator. Use positive pressure self-contained breathing apparatus for emergency conditions where exposure limits are exceeded.

VENTILATION: Local exhaust ventilation.

PROTECTIVE CLOTHING: Full-body protective clothing, acid resistant gloves and boots made of natural rubber, neoprene or nitrile.

EYE PROTECTION: Face shield with chemical worker goggles.

OTHER PROTECTIVE EQUIPMENT: Maintain a sink, safety shower, eyewash fountain in work area. Have oxygen readily available.

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IX. REGULATORY STATUS

TSCA Inventory Status: TSCA Certified

Transportation Status: DOT

Proper Shipping Name:	Sulfuric Acid
Hazard Class:	Corrosive Material
ID No.:	UN1830
Label:	Corrosive

SARA Title III

Section 302 Extremely Hazardous Substance List:	YES
Section 313 Toxic Chemicals:	YES

Reportable Quantity (RQ), under U.S. EPA CERCLA: RQ = 1000 lbs

RCRA Hazardous Waste: D002 (Corrosive)
D003 (Reactive)

California Proposition 65: Not listed

Massachusetts Right-to-Know:
This product contains sulfuric acid, a substance on the Massachusetts Substance List.

X. REFERENCES

(1) RTECS, 79837
(2) Sittig, Handbook of Toxic and Hazardous Chemicals and Carcinogens, 2nd ed.
(3) Sax, Dangerous Properties of Industrial Materials, 6th ed
(4) Merck Index, 10th ed
(5) Documentation of TLVs and BEIs, ACGIH
(6) Sulfuric Acid Hazardous Substance Fact Sheet, New Jersey Dept. of Health.
(7) Dreisbach, Handbook of Poisoning, 12th edition

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A in right margin indicates additional information since last revision.
R in right margin indicates a revision.

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